## **Patent Claims**

- 1. A method for the identification and/or quantification of endothelial cells being related to cardiovascular diseases in a sample, wherein the method comprises the following steps:
- (a) obtaining a sample to be analyzed containing endothelial cells;
- (b) incubating the sample with one or several molecules that specifically bind to one or several of the following marker molecules of the endothelial cells:
- endothelial cell-markers and/or markers for apoptosis, or
- endothelial cell-markers and/or markers of endothelial precursor cells;
- (c) identification and/or quantification of the endothelial cells on the basis of the bound molecules by using immunocytological methods; and
- (d) comparing the result obtained for the sample to be analyzed with the result of a reference sample.
- 2. Method according to claim 1, wherein said endothelial cells are derived from a mammal, in particular from a human.
- 3. Method according to claim 1 or 2, wherein said endothelial cells are selected from the group consisting of apoptotic endothelial cells, endothelial precursor cells, and mature endothelial cells.
- 4. Method according to any of claims 1 to 3, wherein said sample to be analyzed is selected from the group consisting of peripheral blood, cell culture-suspensions and suspensions containing cells that have been released mechanically, chemically and/or enzymatically from the wall of a vessel.
- 5. Method according to claim 4, wherein said sample to be analyzed is peripheral blood.
- 6. Method according to claim 5, wherein a coagulation inhibitor, in particular heparin, is added to the peripheral blood.
- 7. Method according to any of claims 1 to 6, wherein said marker-binding molecules are selected from the group consisting of antibodies or parts or fragments thereof, and receptor ligands or parts thereof.

- 8. Method according to claim 7, wherein said antibodies or parts or fragments thereof comprise polyclonal antibodies, monoclonal antibodies, Fab-fragments, scFv-fragments, and diabodies.
- 9. Method according to any of claims 1 to 8, wherein said marker-binding molecules are present in solution or matrix-immobilized.
- 10. Method according to any of claims 1 to 9, wherein said marker-binding molecules are coupled to one or several detection molecules from the group consisting of fluorescein thioisocyanate, phycoerythrine, enzymes, and magnetic beads.
- 11. Method according to any of claims 1 to 10, wherein said marker-binding molecules are detected with an antibody being coupled to one or several detection molecules.
- 12. Method according to any of claims 1 to 11, wherein said endothelial cellular marker is selected from the group consisting of CD146, von Willebrandt-factor (vWF), and vascular endothelial growth factor-receptor 1 (VEGF-receptor-1).
- 13. Method according to any of claims 1 to 12, wherein said marker for apoptosis is selected from the group consisting of annexin V, and PD-ECGF.
- 14. Method according to any of claims 1 to 13, wherein said markers of endothelial precursor cells are selected from the group consisting of CD133 and CD34.
- 15. Method according to any of claims 1 to 14, wherein furthermore at least one marker being characteristic for non-endothelial cells is determined, such as, for example, CD45.
- 16. Method according to any of claims 1 to 15, wherein said immunocytological methods are selected from the group consisting of flow cytometry and solid-phase-immunoassays.
- 17. Method according to any of claims 1 to 16, wherein said reference sample is derived from a mammal, wherein a cardiovascular disease was excluded.

- 18. Method according to any of claims 1 to 17, wherein said result for apoptotic endothelial cells is brought in relation with the result for the totality of endothelial cells.
- 19. Method according to any of claims 1 to 17, wherein said result for apoptotic endothelial cells is brought in relation with the result for the endothelial cells.
- 20. Method according to any of claims 1 to 19, further comprising a lysis of the erythrocytes between step (a) and (b).
- 21. Method according to any of claims 1 to 20, wherein said cardiovascular diseases are selected from the group consisting of stable and unstable angina, myocardial infarction, acute cardiac syndrome, coronary arterial disease and heart insufficiency.
- 22. Diagnostic kit, comprising means for performing the method according to any of claims 1 to 21, optionally together with additional components and/or excipients.
- 23. Use of the method according to any of claims 1 to 21 for the diagnosis and/or prognosis of cardiovascular diseases and/or for the monitoring of their therapy.
- 24. Use according to claim 23, wherein said therapy comprises the administration of lipid lowering substances, selected from the group consisting of statines, in particular atorvastatin.